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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,711	09/22/2003	Karl-Heinz Aleksander Ostoja Starzewski	PO7795/LeA 36,276	1415
34947	7590	03/07/2006	EXAMINER	
LANXESS CORPORATION 111 RIDC PARK WEST DRIVE PITTSBURGH, PA 15275-1112			LU, C CAIXIA	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/667,711

Applicant(s)

STARZEWSKI ET AL.

Examiner

Caixia Lu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 1-7, 9, 19 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8, 10-18 and 21-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Request for Continued Examination***

1. The request for continued examination (RCE) under 37 C.F.R. §1.114 is acceptable. An action on the RCE follows.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Specification***

3. The disclosure is objected to because of the following informalities: Brief Description of the Drawing section is not provided.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. Claims 8, 10-18 and 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ostoja-Starzewski et al. (US 6,353,064, hereinafter referred as Ostoja).

The instant claims are directed to a polymerization process of unsaturated monomers in the presence of a metallocene complex, wherein the metallocene complex have at least one donor-acceptor interaction between two of its ligands, at least one of the ligand is fluorenyl ligand and at least one alkyl or aryl group is on at least one acceptor atom; wherein, the polymerization is conducted at a temperature from -60 to 250 °C and the polymer produced have a number molecular weight [sic] greater than 500 kg/mol.

Ostoja teaches an olefin polymerization process in the presence of metallocene complex having one donor-acceptor interaction between two of its ligands at temperature range of 45 to 250 °C. See formula (Ia) of col. 2, lines 35-40, col. 14, lines 15-67, col. 16, lines 33-42, and Examples 1-8. When Cpl or CpII of formula (Ia) is fluorenyl (col. 3, lines 49-50) and the acceptor group is alkylboranyl or arylboranyl (col. 12, lines 44-52), Ostoja's metallocene complex read on those metallocene complexes of the instant claims. Among Ostoja's working examples, only Example 1 disclosed the mean molar mass  $M_n$  of 402 kg/mol which is lower than the than 500 kg/mol of the instant claims. However, it is noted that activator such as alumoxane is not used in the working examples. Activator such as alumoxane are known in the art of olefin polymerization in the presence of metallocene catalyst for its ability of increasing molecular weight of the polyolefin. Use of aluminoxane as activator are taught in Ostoja (col. 14, lines 15-45).

Thus, it would have been obvious to a skilled artisan at the time the invention was made to employ Ostoja's teaching to conduct olefin polymerization in the similar conditions as shown the working examples by replacing the metallocene complex with the metallocene complex Ia) wherein Cpl or CpII of formula (Ia) to be fluorenyl and acceptor group to be alkylboranyl or arylboranyl and adding aluminoxane as the activator to provide a polymer with increased molecular weight since such within the scope of Ostoja's teaching and expected to work and in the absence of any showing of criticality and unexpected results.

It is noted that the newly added claims 27 and 28 further limit the polyolefin having long chain branching and bimodal molecular weight distribution, however, those characteristic are expected to be inherently in Ostoja's process. First of all, the bimodal molecular weight distribution is caused by the equilibrium of between the donor and acceptor of the metallocene complex which provides two different catalytic centers and thus two molecular weight distribution. Secondly, metallocene catalysts are known for produce polyolefins with long chain branching and so should Ostoja's metallocene catalysts.

5. Applicant's arguments filed January 17, 2006 have been fully considered but they are not persuasive.

Applicants argue that the claimed process unexpectedly provides elastomers with bimodal molecular weight distributions and long chain branching. However, those characteristic should be inherently in Ostoja's process. First of all, the bimodal molecular weight distribution is caused by the equilibrium of between the donor and acceptor of the metallocene complex which provides two different catalytic centers and thus two molecular weight distribution. Secondly, metallocene catalysts are known for produce polyolefins with long chain branching and so should Ostoja's metallocene catalysts.

Applicants assert that the polymer produced has lower molecular weight when MAO is used as cocatalyst instead of TIBA/montmorillonite in Ostoja's Examples 1-3 and 9. However, there is nothing on the record to support such statements. It is also noted that Ostoja's Examples use TIBA alone as the cocatalyst rather than

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TIBA/montmorillonite. Furthermore, it is the examiner position that those showing, even if they are proper, are not commensurate with the scope of the instant claims because the instant claims do not limit the cocatalyst to MAO (methyl aluminoxane).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caixia Lu whose telephone number is (571) 272-1106. The examiner can normally be reached from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful and the matter is urgent, the examiner's supervisor, David Wu, can be reached at (571) 272-1114. The fax numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1700.



Caixia Lu, Ph. D.  
Primary Examiner  
March 3, 2006